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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

CHACKO DAVIS, DABORAH

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/512,113	Applicant(s) BHANGALE ET AL.	
	Examiner DABORAH CHACKO DAVIS	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 August 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25,27-30 and 32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-25,27-30,32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-6, 10-19, 27-30, 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent No. 5,405,656 (Ishikawa et al., hereinafter referred to as Ishikawa) in view of U. S. Patent No. 5,731,364 (Sinta et al., hereinafter referred to as Sinta) and U. S. Patent No. 5,981,135 (Koes et al., hereinafter referred to as Koes).

Ishikawa, in the abstract, in col 5, lines 10-45, in col 7, lines 23-66, in col 8, lines 12-69, in col 10, discloses a method of electroless plating (deposition) of a metal on selected portions of a ITO substrate i.e., a substrate coated with a layer of ITO, the substrate being a glass substrate, exposing the ITO substrate selectively to a catalytic treatment by immersing in a solution of catalytic particles (the colloidal suspension of catalytic metal, palladium) resulting in the adsorption of the catalytic ions (particles) to selected portions of the ITO substrate, after which the selectively catalytic-metal nucleated ITO substrate is immersed in a chemical bath for electroless plating of the desired metal to form a metal layer such as nickel on the selected exposed portions of the ITO, thereby forming a structure of substrate with a ITO surface that is selectively nucleated with a catalytic metal and a then plated with a desired metal such that none of the catalytic metal is adsorbed directly on the substrate surface. Ishikawa, in col 5, lines

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60-67, discloses that the patterned ITO layer is exposed to the ionic solution (catalytic solution of Pd^{2+}) i.e., after removing the layer (masking layer) that was used to pattern the ITO, It is then subjected to catalytic nucleation in the selected exposed areas (claims 1, 4-6, 10, 12, 19, 28-30, and 32).

The difference between the claims and Ishikawa is that Ishikawa does not disclose that the formation of the catalytic particles on selective regions of the ITO layer is by masking certain portions of the ITO layer with a masking layer, wherein the masking layer is of the claimed composition. Ishikawa does not disclose forming the apertures in the masking layer that is formed on the ITO film (claims 2-3), and forming the apertures as recited in claim 16. Ishikawa does not disclose the masking layer recited in claim 11. Ishikawa does not disclose the masking layer as a photoresist or a dry film resist as recited in claims 13-15. Ishikawa does not disclose the cleaning processes recited in claims 17-18. Ishikawa does not disclose that the masking layer (resist pattern) is removed after forming the metal layer (via plating), and that a strongly basic solution is used to remove the masking layer (remaining resist pattern mask) (claim 27).

Sinta, in the abstract, in col 11, lines 26-67, discloses the ITO coated substrate is patterned by forming on the ITO film, a photoresist layer (dry resist film, photosensitive film) that is exposed via UV lithography, and then developed in a developer (basic solution) (i.e., removes the undesired resist and removes residues from the now selective portions of the exposed surface of ITO) to form apertures on the ITO film layer, and then the masked ITO film can be further processed with plating to selectively form

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the plating on the exposed surface. Sinta, in col 8, lines 55-63, in col 9, lines 10-39, discloses that the resist can be an acrylate. Sinta, in col 11, lines 64-67, discloses that the resist pattern formed on the ITO substrate can be further subjected to a plasma etch.

The difference between the claims and Ishikawa in view of Sinta is that Ishikawa in view of Sinta does not disclose that the masking layer (resist pattern) is removed after forming the metal layer (via plating), and that a strongly basic solution is used to remove the masking layer (remaining resist pattern mask) (claim 27).

Koes, in col 11, lines 12-22, discloses that after plating the surface that has a resist pattern, the remaining resist pattern that is used as the mask is removed via stripping using an alkaline solvent (strongly basic solution).

Therefore, it would be obvious to a skilled artisan to modify Ishikawa by employing the process of using a resist pattern as a mask to perform the selective plating process on the ITO film as suggested by Sinta because Ishikawa, in col 5, lines 60-68, discloses that the catalytic solution exposure is performed on a patterned surface of the ITO i.e., resist patterning process is performed on the ITO film, and Sinta, in col 11, lines 40-67, discloses that performing the claimed resist masking process, using the claimed resist composition and performing the claimed cleaning processes on a ITO coated glass substrate enables the plating on a selected portion of the ITO film coated substrate, while the portion not desired to be plated is masked by the resist pattern. Therefore, it would be obvious to a skilled artisan to modify Ishikawa in view of Sinta by employing a stripping process after the plating process as suggested by Koes because

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Koes, in col 11, lines 19-22, discloses that performing the stripping in the alkaline solvent reveals the desired pattern of copper traces or plated features.

3. Claims 7-9, 20, are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent No. 5,405,656 (Ishikawa et al., hereinafter referred to as Ishikawa) in view of U. S. Patent No. 5,731,364 (Sinta et al., hereinafter referred to as Sinta) and U. S. Patent No. 5,981,135 (Koes et al., hereinafter referred to as Koes) as applied to claims 1-6, 10-19, 27-30, 32, and further in view of European Patent Application No. 0518422 (De Bakker et al., hereinafter referred to as De Bakker).

Ishikawa in view of Sinta and Koes is discussed in paragraph no. 2.

The difference between the claims and Ishikawa in view of Sinta and Koes is that Ishikawa in view of Sinta and Koes does not disclose that the catalytic metal particles (metal particles in the plating solution) are polymer-stabilized (claim 7), and that the stabilizer is selected from the group recited in claim 8, and that the stabilized using the solution claimed in claim 9. Ishikawa in view of Sinta and Koes does not disclose that the selected exposed portions of the substrate (exposed portions that are plated) are rinsed in de-ionized water (claim 20).

De Bakker, in col 2, lines 12-22, and lines 41-58, and in col 3, lines 1-15, discloses that the electroless solution (colloidal ionic solution) used for plating the ITO layered substrate selectively (i.e., in selected portions of the ITO only) contains a stabilizer such as polyvinyl alcohol or polyvinyl pyrrolidone, and that the catalytic metal used for plating are stabilized in a solution containing Sn^{4+} ions. De Bakker, in col 4,

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lines 58, in col 5, lines 1-2, discloses that following the plating, the plated ITO (selectively) layered substrate is rinsed in de-ionized water.

Therefore, it would be obvious to a skilled artisan to modify Ishikawa in view of Sinta and Koes by employing the stabilizer containing plating solution for plating and rinsing the plated ITO layered substrate with deionized water as suggested by De Bakker because De Bakker, in col 2, lines 11-24, and in col 3, lines 1-16, and in col 4, lines 45-58, in col 5, lines 1-1-14, discloses that using a stabilizer during plating, followed by rinsing in the claimed manner results in the prevention of flocculation of the metal particles to be coated, and prevents the disappearance of catalytic activity and also avoids the adherence of the metal particles to be coated/or plated from adhering on the glass substrate directly and at the same time meets the tape test requirement for adhesion.

4. Claims 21-25, are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent No. 5,405,656 (Ishikawa et al., hereinafter referred to as Ishikawa) in view of U. S. Patent No. 5,731,364 (Sinta et al., hereinafter referred to as Sinta) and U. S. Patent No. 5,981,135 (Koes et al., hereinafter referred to as Koes) as applied to claims 1-6, 10-19, 27-30, 32, and further in view of European Patent Application No. 0518422 (De Bakker et al., hereinafter referred to as De Bakker) and U. S. Patent No. 5,395,678 (Matsushima et al., hereinafter referred to as Matsushima).

Ishikawa in view of Sinta and Koes and De Bakker is discussed in paragraph no. 3, above.

Ishikawa, in col 7, lines 23-66, discloses that the selectively catalytic-metal nucleated ITO substrate is immersed in a chemical bath for electroless plating of the desired metal to form a metal layer on the selected exposed portions of the ITO, thereby forming a structure of substrate with a ITO surface that is selectively nucleated with a catalytic metal and a then plated with a desired metal such that none of the catalytic metal is adsorbed directly on the substrate surface.

The difference between the claims and Ishikawa in view of Sinta and Koes and De Bakker is that Ishikawa in view of Sinta and Koes and De Bakker does not disclose that the rinsed portions are dried as claimed in claim 21. Ishikawa in view of Sinta and Koes and De Bakker does not disclose that the drying step includes placing the rinsed layered substrate (substrate with an ITO layer that is selectively plated at selected exposed portions of the ITO) in an oven (claim 22). Ishikawa in view of Sinta and Koes and De Bakker does not disclose that the drying step includes blowing a stream of gas over the layered substrate (claim 23). Ishikawa in view of Sinta and Koes and De Bakker does not disclose that the drying step includes both placing the layered substrate in the oven and blowing it with a stream of gas (claim 24).

Matsushima, in col 13, lines 41-50, discloses that that plated ITO layered substrate was rinsed in water, and then dried by blowing air (a stream of gas) and baking at 200°C (placing in the oven).

Therefore, it would be obvious to a skilled artisan to modify Ishikawa in view of Sinta and Koes and De Bakker by drying the rinsed substrate in the method taught by Matsushima because, the drying process removes any residual of water on the plated

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film, and Matsushima, in col 13, lines 50-54, discloses that when using the claimed drying method the plated film did not strip from the surface of ITO film during an adhesive tape strip test.

Response to Arguments

5. Applicant's arguments filed August 17, 2009, have been fully considered but they are not persuasive. The 103 rejections made in the previous office action have been maintained.

A) Applicants argue that the examination of Ishikawa makes it clear that the present claims are not obvious.

Ishikawa teaches the selective electroless plating process. Ishikawa does teach forming a patterned ITO layer and in order to do so, Sinta is relied upon to disclose the photolithographic process i.e., forming a mask layer on the ITO, exposing, and developing and selective plating of the exposed areas, and then subjecting the plated (in the exposed areas), but still masked substrate to etch i.e., the resist that remained as a mask will be removed. However, Koes is relied upon to disclose the removing of the mask layer. Ishikawa does not teach against a photolithographic process.

Therefore, Ishikawa in view of Sinta and Koes render the instant claims obvious.

B) Applicants argue that Ishikawa teaches against masking "portions of a substrate other than those on which Pt electrodes are to be formed, applying a catalyst under such a masking condition in a conventional manner" which requires removing the mask in a manner that increases the number of steps needed to form the electrodes.

Applicant is picking and choosing words from different sentences of portions cited in the Background of Ishikawa. However, nowhere is it cited in Ishikawa, that a photolithographic process causes an increase in the number of steps to form electrodes. Applicant is citing col 2, lines 61- through 67, col 3, lines 1-7; but has conveniently omitted lines 3-6, which clearly discloses an adhesive masking tape method of selective plating, not photolithography. Also, Ishikawa cites in the same portion, mentioned above, the benefits of reduced costs; and it is the masking of each article with adhesive tape that may cause an increase in step, and not photolithography. In photolithography, the resist layer formed is exposed and developed resulting in mask formation throughout the desired areas to be masked, it does not require multiple steps to form a masked area i.e., once developed a plurality of masked areas are obtained in a single step. Also, Ishikawa teaches forming a patterned ITO layer, not a blank ITO layer to be plated, but a patterned ITO layer that is plated selectively. Also, see paragraph A), above.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daborah Chacko-Davis whose telephone number is (571) 272-1380. The examiner can normally be reached on M-F 9:30 - 6:00. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark F Huff can be reached on (571) 272-1385. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Daborah Chacko-Davis/
Examiner, Art Unit 1795

December 6, 2009.